

PNRR M4C2

Ecosystems for Innovation

SAMOTHRACE

SICILIAN MICRO AND NANO TECHNOLOGY
RESEARCH AND INNOVATION CENTER

SAMOTHRACE Foundation

University of Catania,
Proposer

Prof. Salvatore Baglio
President



**Università
di Catania**

CONTENT

- **SiciliAn Micro and Nano Technology Research and Innovation Center** (SAMOTHRACE): *the ecosystem*.
- *The ambition and the vision of a «catalyzer for innovation».*
- Who we are: a sicilian-wide initiative to leverage at global level
- Topics addressed
- The «respectable» investment size: seed money to be used cautiously
- About the expected impact



Università
di Catania



SAMOTHRACE ... in figures

Entity Name	Proposer	Hub	Spoke	Affiliate to Spoke
Università degli studi di Catania	x	x	x	x
Università KORE Enna		x		x
TopNetwork S.p.a.		x		x
Università di Messina		x	x	x
Parco Scientifico e Tecnologico Sicilia		x		
Fondazione Emblema		x		
Università degli Studi di Palermo		x	x	x
Distretto Tecnologico Micro e nano Sistemi Sicilia s.c.a r.l.		x		
Etna Digital Growth s.r.l. (EDG)		x		x
Consiglio Nazionale delle Ricerche (CNR)		x	x	
Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA)		x		x
STLabs		x		x
INFN		x	x	
Quantum Leap IP – Divisione di Infinity Edge srl		x	x	
UPMC Italy		x	x	
Istituto Ortopedico Rizzoli		x		x
Etna HiTech S.C.p.A.		x		x
STMicroelectronics S.r.l.			x	
Meridionale Impianti s.p.a.			x	
INGV				x
Fondazione Bruno Kessler (FBK)				x
Power Evolution				x
Engineering Ingegneria Informatica S.p.A.				x
Bcame s.r.l.				x
LPE s.p.a.				x
Xenia Progetti s.r.l.				x
Rainshow s.r.l.				x
Advanced Medical Engineering Devices				x
Hub - SAMOTHRACE				
	1	17	9	19

- 28 partners
- 17 founding members
- 9 spokes
- 997 participant subjects
- 140 Meur total budget
- 120 Meur total contribution
- 115 Young researchers (RTDa)
- 69 PhDs
- 36 months



SAMOTHRACE ... ambition and vision

- SAMOTHRACE has the ambition **to leverage the consolidated vocation of Sicily in the area of microelectronics and micro and nano technologies** to an even higher and more diffuse level.
- The whole set of activities builds on the «*fil rouge*» of **micro and nano technologies, microelectronics, materials, microsystems and devices**
- Six major areas of interest are addressed: **energy, health, smart mobility, environment, cultural heritage and smart agriculture.**



Università
di Catania



SAMOTHRACE ... ambition and vision

- As for the Greek myth of «*Nike*», the winged victory of Samothrace island, the vision of the SAMOTHRACE ecosystem of innovation is **to use the wings of microelectronics and microtechnologies to bring Sicily beyond its current limits** to successful accomplishments that, passing through areas such as energy, health, smart mobility, environment, cultural heritage, smart agriculture will have **a tangible impact on industries and on the society as a whole.**



Università
di Catania



SAMOTHRACE ... and regional strategies

- SAMOTHRACE perfectly aligns with the priorities identified by the regional strategy 2021-2027:
 - a more competitive and smart Sicily;
 - a greener Sicily;
 - a more connected Sicily through the strengthening of mobility;
 - a more inclusive Sicily;
- The six areas of SAMOTHRACE fits within the scope of intervention defined by Regional Strategy for Intelligent Specialization (S3) as *those in which the business/regional research combination is able to express its greatest potential.*



Università
di Catania



SAMOTHRACE ... and regional strategies

- In particular SAMOTHRACE resonates also with the recently introduced new thematic area, **“Environment, natural resources and sustainable development”** (**“Ambiente, Risorse Naturali, Sviluppo Sostenibile”**).
- SAMOTHRACE will exploit all the new elements that move on the regional territory, identifying and supporting the interactions between the research skills of the Regional Universities/Research Centers and the entrepreneurial visions present.
- A spillover process for the valorization of know how will build over the peaks of excellence.



Università
di Catania



SAMOTHRACE Foundation ... who we are

- 28 partners (25 + 3)
- 4 Universities, 5 Research institutes
- 4 large companies
- 10 PMEs



Rainshow S.r.l.



Università di Catania



SAMOTHRACE ... scientific objectives

- **Six application areas:** Energy, Environment, Smart Mobility, Smart systems for precision agriculture, Health, Cultural Heritage
- **9 SPOKES:** each one characterized by specific activities and objectives
- The collaborations among the research entities and the industrial partners are framed by several activities and the proposed goals under the same or similar topic.
- **The Sicilian Ecosystem will have the role of boosting interconnections therefore facilitating the sharing of knowledge and good practices among all partners with the goal of fostering innovation through an efficient technology transfer process.**



Università
di Catania



SAMOTHRACE ... scientific objectives

Energy

- Materials, technologies and systems for **energy production, storage and harvesting** from ultra-low to high power applications.
- **Wide Band-Gap (WBG) Power Electronic Devices** (for greater power efficiency, smaller size, lighter weight, lower cost).
- Nuclear based approach as particle accelerators for carbon free energy production
- Key technologies to support the energy and ecological transition
- Advanced digital solutions to meet future energy related issues

Environment

- **Innovative solid-state sensors**
- **Lab-on-a-chip**
- Devices for **environmental monitoring**, prediction of eruptions and earthquakes, protection of natural water bodies, earthquake engineering, landslide risk and soil-water interaction in coastal zones.
- Innovative sensors (both silicon and silicon carbide photosensors and **biosensors on nanodevices**).
- Analysis of **Big Data** through Earth Observation systems for monitoring of environmental phenomena.



Università
di Catania



SAMOTHRACE ... scientific objectives

Smart Mobility

- Wireless technologies (MIMO and mmWaves) for **reliable interconnection within vehicles**
- **SiC and/or GaN monolithic power switching** system to minimize losses in energy exchanges in automotive applications
- **Smart sensors for traffic** and condition evaluation and for reliable control of V2X technologies (C-ITS and CCAM) in smart roads.
- Advanced devices and **software solutions for Vehicle** (zero emission and autonomous driving) and for traffic control.

Smart systems for precision agriculture

- Development of **smart systems for a sustainable management of water**, reduction of environmental impact of livestock production, harmful undesirable bioproduct detection.
- **Continuous monitoring** of crops, growth and health of the crops, irrigation water quality and management, agrochemicals efficiency improvement.
- Development of **"smart" hybrid organic/inorganic nano-systems**, and liquid ammonia "green" production", new techniques for distributed monitoring systems in agriculture.

Università
di Catania



SAMOTHRACE ... scientific objectives

Health

- Devices for ***in-vitro diagnostic*** (IVD).
- Smart ***wearable and implantable*** devices. Microfluidic devices.
- Devices for managing and analyzing liquid biopsy samples from patients.
- Devices for ***Molecular diagnostics*** (MD).
- Development of compact and miniaturized (laser-plasma or dielectric-laser) ***particle accelerators***.
- SiC particle detectors for dose measurements in radiation dosimetry.
- Organizational model for telemedicine systems in virtual hospitals

Cultural Heritage

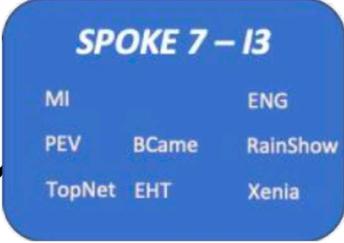
- Devices for high-level ***precision and authenticity certificates***, intervention and investigation protocols.
- Smart materials for the ***consolidation, cleaning, protection and restauration*** of movable and immovable artifacts of historical interest.
- Micro and nanoscale smart devices for ***intelligent fruition system of the artworks***.
- ***Smart packaging*** for the transport of works of art.
- Wearable devices for remote Virtual Tours and Local Augmented Reality Tours.

Università
di Catania



SAMOTHRACE ... organization

Hub + Nine spokes



Impact analysis ... 1/3

QUANTITATIVE assessment of the expected impact in relation to the funding expected for SAMOTHRACE 1/2



An appropriate management of Intellectual Property enables a profitable co-research and co-development relationship, fostering the correlation between IP Strategy and Business Strategy in an effective and coherent way.

The application of the **IP LCM process** - conceived and validated by QL - will allow the technological solutions developed by SAMOTHRACE to be effectively marketed. In this perspective, Technology Transfer is always aimed at go-to-market in an optimised approach and timeframe.

QL's objective is therefore to be a TT stakeholder in the Region of Sicily for the years to come with a long-term vision that also includes an expansion of its local organisational structure.

The benefits deriving from the proper creation, management and valorisation of IP refer to an **increase in the turnover of the small and medium-sized enterprises involved and an increase in the market value of the start-ups and spin-offs that will be created.**

Indeed, we can take as a benchmark the results obtained by SATT (Sociétés d'accélération du transfert des technologies) in France, a structure comparable to SAMOTHRACE.

SATTs assessment of their socio-economic impacts since their creation in 2010 up to 2020:

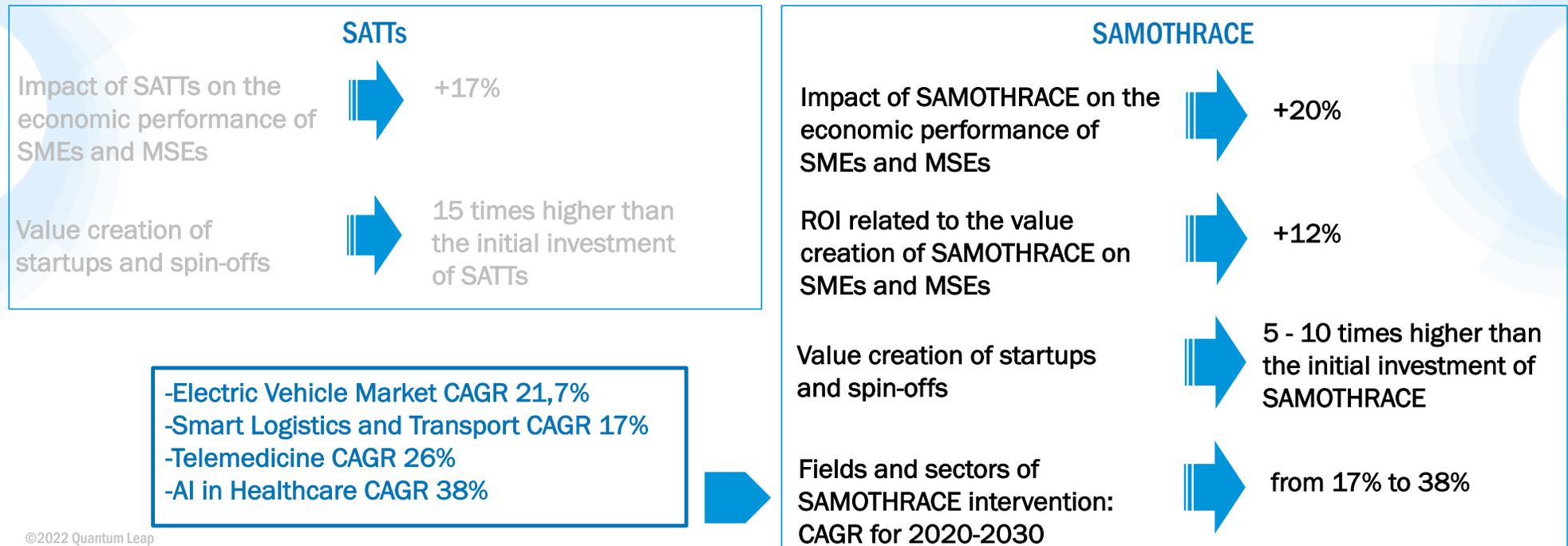
more than 400 startups have been supported. 37% of them are in the field of biology and health, 27% in digital technology and 36% in engineering sciences. These companies, created and/or supported by the SATTs, are currently valued at more than €1 billion, a valuation more than 15 times higher than the amount invested by the SATTs.

Impact analysis ...2/3

QUANTITATIVE assessment of the expected impact in relation to the funding expected for SAMOTHRACE 2/2



As the SATTs also boosted the R&D performance of existing French research centres and companies, the SAMOTHRACE Technology Transfer Spoke will have an impact on small and medium-sized enterprises (SMEs and MSEs) in particular, providing them with the means to become more competitive and more innovative. The companies involved will see their added value increase over the next 10 years thanks to SAMOTHRACE TT Spoke 9.



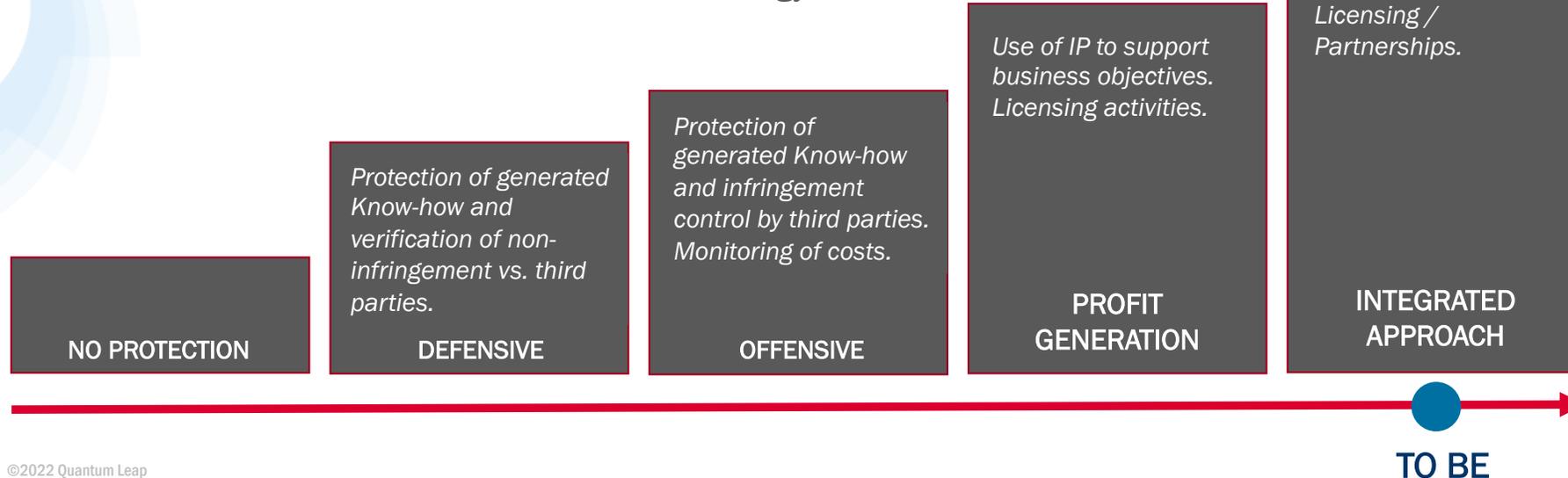
Impact analysis ... 3/3

Medium/long-term sustainability of expected actions and targets



Strategic use of Intellectual Property

The creation, management and valorisation of an IP portfolio are strategic activities for business consolidation and for the positioning of Italian organisations in the international market in terms of competitiveness and technological growth. The objective is to accelerate the technological and competitive growth of the Italian research-enterprise system by supporting the creation of a correct and successful IP Strategy.



The Ecosystems

- SAMOTHRACE represents 1 out of a total of 11 proposal approved all over Italy. Only four of these are in the meridional areas.
- SAMOTHRACE represents one of the largest single investment in Sicily in «Mission 4» of PNRR (120 Millions of Euros)
- It is to be considered «seed money» that is intended to leverage the industrial and societal impact: it is a «stimulating» BIG CHALLENGE !
- Happy to see concretized here the the first result of the strategic agreement made with the Sicilian Government and the four universities.



Università
di Catania



PNRR M4C2

Ecosystems for Innovation

SAMOTHRACE

SICILIAN MICRO AND NANO TECHNOLOGY
RESEARCH AND INNOVATION CENTER

SAMOTHRACE Foundation

University of Catania,
Proposer

Prof. Salvatore Baglio
President



**Università
di Catania**